Space Weather Forecast

Issued on Thursday, 29 June 2023 at 13:10 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate solar activity likely. Slight chance of Minor Geomagnetic Storm on 01 July.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low, with several Common-class flares over the 24 hour period. The sunspot region near north centre disc has continued its growth over the past 24 hours and is now a very large region, with some magnetic complexity. A further region near the northwest limb has a history of moderate solar activity, but is becoming difficult to assess as it approaches the limb. The other regions remained small or simple, with no significant change. A Coronal Mass Ejection (CME) which left the northeast of the Sun late on 27 June from the vicinity of the largest region has been analysed and is forecast to glance the Earth on 01 July, but with low confidence. No further Earth directed CMEs were observed in the period.

Solar Wind / Geomagnetic Activity: The solar wind was slightly elevated or occasionally elevated with wind speeds between 430 and 520 km/s. The total magnetic field strength was weak, with the north-south component also varying weakly, although it has been more southward directed in recent hours. Geomagnetic activity was Quiet to Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) has been at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Low to Moderate, with a slight chance of Strong flares, mainly from the large sunspot near centre disc.

Solar Wind / Geomagnetic Activity: A CME which left the Sun on 27 June may glance the Earth early on 01 July, but this is low confidence. Otherwise in the absence of CME activity, the current slightly elevated solar wind speeds are expected to slowly decline to near ambient levels. Geomagnetic activity is expected to be mainly Quiet to Unsettled, with a slight chance of G1/Minor Storms, mainly on 01 July, due to the potential CME glance.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is most likely to remain at background levels with no solar radiation storms occurring. However, there is a slight chance of count rates increasing should any larger flares occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	5	20	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	60	60	50	50
Very Active	R3 to R5 X	No	15	15	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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